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Transmitted herewith for filing under 37 CFR 1.53(b) is a(n): ☒ Utility () Design
(☒) original patent application,
() continuation-in-part application

INVENTOR(S): Gregory T. Hulan

TITLE:

DIGITAL COPYING MACHINE INCLUDING PHOTO FEATURES FUNCTION

Enclosed are:

(X) The Declaration and Power of Attorney. (☒) signed () unsigned or partially signed
(☒) 4 sheets of drawings (one set) () Associate Power of Attorney
() Form PTO-1449 () Information Disclosure Statement and Form PTO-1449
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DIGITAL COPYING MACHINE INCLUDING PHOTO FEATURES FUNCTION

BACKGROUND OF THE INVENTION

The invention relates to digital copiers. More specifically, the invention relates to the digital copying of photographs.

“All-in-One” and multifunction machines combine the capabilities of
5 printers, scanners and copiers into a single compact package. By replacing a
standalone printer, a standalone scanner and a standalone copier, a single All-in-
One machine can free up desk space and reduce the number of computer cables.
These features make the All-in-One machines ideal for home businesses.

All-in-One machines such as the “HP OfficeJet R Series” from Hewlett-
10 Packard Company include inkjet print modules that are capable of photo-quality
color printing. An R-80 All-in-One machine, for instance, can scan a photograph
and print the scanned photo on photo-quality paper. Quality of the copy matches
that of the original. Using a zoom function, the copy can be made larger or
smaller than the original. Using a clone function, multiple copies of the original
15 can be printed onto a single sheet of paper.

These features make the All-in-One machine ideal for home use too.
Photographs can be scanned, printed out and distributed immediately instead of
traveling to a photo shop and waiting for copies to be made. Pictures of
newborns and toddlers can be conveniently and immediately distributed to friends
20 and relatives. Use of the clone function can save paper, especially for wallet-
sized copies.

It is usually desirable to distribute copies that have standard sizes, such as
wallet size and 5”x7” size. A photograph having a non-standard size can be
difficult to place in a wallet or standard size frame.

25 However, using All-in-One machines to make standard size copies can be
cumbersome. For example, if a person has a 3”x5” original of his or her newborn

infant and wants wallet size copies, the person selects a "Clone 100%" function and calculates the zoom percentage that is needed to create the desired copy size. In this case, a zoom percentage of 70% is calculated (this all requires measurements of the original to be taken, an understanding of math and the use
5 a calculator). The person reduces the clone size to 70% and presses a "copy" button. The machine pre-scans the original and calculates the actual size of the original. The machine then calculates the number of copies that can fit on a single sheet, performs a full scan of the original and prints the copies.

If that person also wants copies of a different size (e.g., a 5" x 7" copy), a
10 new zoom percentage is calculated, the clone function is selected again, the clone size is changed to the new zoom percentage, and the copy button is pressed again. If two copies of a standard size such as 5" x 7" are desired, the copy button is pressed yet another time (since only one 5" x 7" copy will appear on each sheet).

SUMMARY OF THE INVENTION

Making copies of standard sizes is made much easier by the present invention. According to one aspect of the present invention, an apparatus
20 includes a scan module; a print module; an input device for allowing a standard photo size to be selected; and a controller for causing the scan module to scan an image. The controller automatically determines actual size of the scanned image, scales copies of the scanned image to the selected size, and causes the print module to print the copies on a single sheet.

25 Other aspects and advantages of the present invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings, illustrating by way of example the principles of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an illustration of a digital copying machine;

Figure 2 is an illustration of a console of the digital copying machine;

Figure 3 is an illustration of a Photo Package;

5 Figure 4 is an illustration of a method of scanning an original and printing
copies of the scanned original; and

Figure 5 is an illustration of an alternative digital copying system.

DETAILED DESCRIPTION OF THE INVENTION

As shown in the drawings for purposes of illustration, the present invention
is embodied in a digital copying machine including a scan module and a photo-
quality color print module. The digital copying machine may be a dedicated digital
copier, an All-in-One machine, etc. The digital copying machine displays a menu
15 of different photo sizes. After a photo size is selected, the digital copying
machine automatically scans a photograph, automatically scales the copies of the
image to the selected size, rotates the copies, if necessary, to utilize a maximum
printable area, and prints the copies on a single sheet. Such copying of photos is
far more convenient than selecting a Clone function, calculating a zoom
20 percentage, reducing clone size to the zoom percentage, and pressing a "copy"
button. No manual calculations are needed.

Figure 1 shows a digital copying machine 10 including a scan module 12
and an inkjet print module 14. The scan module 12 is capable of color scanning
of photographs. For example, the scan module 12 may have a 600x2400 dot per
25 inch ("dpi") optical resolution in 30-bit color and 8-bit grayscale. The print module
14 is capable of photo-quality color printing. For example, the print module 14
may perform 600x600 dpi printing using three printable colors and "PhotoREt II"
color layering technology, which mixes color dots to create millions of solid colors.
The print module 14 may be able to print on photo quality paper such as an 8.5" x
30 11" high gloss photo paper.

The digital copying machine 10 also includes a controller 16, which may have a processor 18, random access memory ("RAM") 20 and read-only memory ("ROM") 22. Stored in the ROM 22 is a program 24 that is executable by the processor 18. When executed, the program 24 instructs the processor 18 to control the scan and print modules 12 and 14.

Referring additionally, to Figure 2, the digital copying machine further includes a console 26, which provides user I/O functions. User output is directed to an LCD 28 of the console 26, and user input is provided by a plurality of buttons. The buttons include a "Copy" button 30 a "Select" button 32, a "Reduce/Enlarge" button 34 and a "+/-" button 36. User I/O functions may be processed by a combination of the processor 18 and the ROM 22.

The ROM 22 also stores a list of different types of machine functions. Repeatedly pressing the Reduce/Enlarge button causes the controller 16 to display different types of functions on the LCD 28. One of the functions is a "Photo Features" function (some of the other functions may include "Auto Fit," "Clone," "2 on 1" and "Legal -> Letter"). The Photo Features function may be selected by displaying the Photo Features function and pressing the Select button 32.

The ROM 22 also stores a list of entries for the Photo Features function. When the Photo Features function is entered, the controller 16 displays a first entry on the LCD 28. Pressing the +/- button 38 causes the controller 16 to display other entries. Some of the entries may include:

- Original -> 9 wallets
- Original -> 4 3"x5"
- Original -> 2 5"x7"
- Original -> 1 8"x10"
- Photo Package

An entry may be selected by pressing the +/- button 34 until that entry is displayed and then pressing the Select button 32. Placing an original on a glass pane of the scan module 12, selecting the Original -> 9 wallets entry and pressing

the Copy button 30 causes the digital copying machine 10 to scan the original and print out a single 8.5"x11" sheet having 9 wallet size copies. Selecting the Original -> 4 3"x5" entry and pressing the Copy button 30 causes four 3"x5" copies to be printed out on a single 8.5"x11" sheet. Selecting the Original -> 2 5"x7" entry and pressing the Copy button 30 causes two 5"x7" copies to be printed out on a single 8.5"x11" sheet. Selecting the Original -> 1 8"x10" entry and pressing the Copy button 30 causes a single 8"x10" copy to be printed out on a single 8.5"x11" sheet. Selecting the Photo Package entry and pressing the Copy button 30 causes the digital copying machine 10 to print out nine wallet size copies on a first sheet of paper, four 3"x5" copies on a second sheet of paper, two 5"x7" copies on a third sheet of paper, and a single 8"x10" copy on a fourth sheet of paper.

The first, second, third and fourth sheets 50, 52, 54 and 56 of the Photo Package are illustrated in Figure 3. The copies of the third sheet 54 are rotated so that two 5"x7" copies fit on a single 8.5" x 11" sheet.

Figure 4 describes the operation of the digital copying machine 10 when the Photo Features entry is selected and the Copy button 30 is pressed. The controller 16 commands the scan module 12 to pre-scan the original (block 102) and uses the output of the scan module 12 to determine the length and width of the original (block 104).

The controller 16 also determines whether the copies should be scaled/rotated in order to utilize maximum print area (block 106). Scaling is proportional. Thus, reducing the length by 5% would result in the width being reduced by the same 5%. A 4"x5" original would be scaled by a zoom factor of 125% to fit into a 5"x7" size. Depending upon the orientation of the original on the glass pane, the controller 16 might also rotate the two copies in order to fit on a single 8.5"x11" sheet. If the 4"x5" original was placed in the same orientation on the glass as in print, the copies would be rotated by 90 degrees. In any event, there is no need for the user to rotate the original on the glass pane of the scan module 12.

The controller 16 then performs a full scan of the original (block 108), generates a raster pattern of the copies (block 110) and sends the raster pattern to the print module 14. The print module 14 prints out the raster pattern onto a sheet of photo quality paper (block 112).

5 If the Photo Package entry is selected, the steps at block 106 to 112 are repeated for each additional sheet (block 114). If, for example, the Photo Package includes two sheets of wallet size photos instead of one, the controller 16 would command the print module 14 to print out two sheets of wallet size copies instead of one.

10 Thus disclosed is a digital copying machine that takes only a few simple console entries to scan a photograph and automatically print one or more sets of standard size copies. Maximum printable area is used. Use of a photo quality color printer and photo quality paper allows photo quality copies to be reproduced. Reproducing copies via the Photo Features function is far more
15 convenient than selecting the Clone function, calculating a zoom percentage, reducing clone size to the zoom percentage, and pressing a "copy" button. No manual calculations are needed.

20 The invention is not limited to a digital copying machine. The invention may be applied to any machine or combination of machines that include a print module, a scan module and an input device for selecting copy sizes. For example, the invention may be applied to a combination 210 of a standalone scanner 212, a standalone printer 214 and a personal computer 216, as shown in Figure 5. The computer 216 includes a microprocessor 218 and memory 220. Stored in the memory 220 are scan and print drivers 222 and 224 for
25 commanding the scanner 212 and printer 214 to perform basic scan and print functions. Also stored in the memory 220 is a program 226 for causing the computer 216 to display a virtual console. The virtual console may include the same display and buttons as the console 26 shown in Figure 2.

30 After an original is placed on the scanner 212, the computer 216 is used to select the Photo Features function, select an entry and start the copying. The

computer 216 commands the scanner 212 to perform a pre-scan of the original, determines whether the copies should be scaled/rotated, commands the scanner 212 to perform a full scan of the original, and commands the printer 214 to print the copies on one or more sheets.

5 The invention is not limited to the console shown in Figure 2. The Photo Features function and different entries may be selected in any number of ways.

 The invention is not limited to the types of entries and standard sizes described above. Other types of entries and standard sizes may be offered. For example, a digital copying machine intended for the European market would use
10 standard photo sizes and sheet sizes that are based on the Metric system.

 The controller may be programmed to offer entries for countries other than, or in addition to, the United States. The selection of the country may be made from the console. Thus, if a European country is selected, the copies may be scaled to a Metric size, rotated and printed out on a sheet of A4 size paper.

15 The controller may include a processor/RAM/ROM, or it may include one or more ASICs, or it may include a combination thereof. The I/O functions may be handled by the controller or by a dedicated circuit.

 Therefore, the invention is not limited to the specific embodiments described above. Instead, the invention is construed according to the claims that
20 follow.

WHAT IS CLAIMED IS:

1. Apparatus for scanning an image and printing copies of the image on a sheet, the apparatus comprising:

a scan module;

a print module;

5 an input device for allowing a standard photo size to be selected; and

means for causing the scan module to scan the image, the means automatically determining an actual size of the scanned image and scaling copies of the scanned image to the selected photo size, the means also causing the print module to print the copies on the sheet.

2. The apparatus of claim 1, wherein the input device also allows a Photo Package entry to be selected, and wherein the means causes copies of a different photo size to be printed on an additional sheet when the Photo Package entry is selected.

3. The apparatus of claim 1, wherein the means also rotates at least one copy to utilize maximum printable area on the sheet.

4. The apparatus of claim 1, wherein the input device prompts for different standard photo sizes.

5. The apparatus of claim 1, wherein the standard photo size is programmably stored in the means.

6. Apparatus for scanning an image and printing copies of the image on a sheet, the apparatus comprising

a scan module;

a print module;

5 an input device for allowing a standard photo size to be selected; and

a controller for causing the scan module to scan the image, the controller automatically determining actual size of the scanned image, generating scanned image copies that are scaled to the selected photo size and that are positioned to utilize maximum printable area on the sheet, and causing the print module to print
10 the copies on the sheet.

7. The apparatus of claim 6, wherein the apparatus is an All-in-One machine.

8. The apparatus of claim 6, wherein the input device also allows a Photo Package entry to be selected, and wherein the controller causes the scan module to print copies of a different photo size on an additional sheet when the Photo Package entry is selected.

9. The apparatus of claim 6, wherein the input device prompts for additional standard sizes.

10. An article of manufacture for an apparatus including a scan module, a print module, an input device, a display device, and a processor, the article comprising:

computer memory; and

5 a program stored in the computer memory, the program, when executed, commanding the processor to display a Photo Features entry on the display device; the program commanding the processor to command the scan module to perform a pre-scan when the Photo Features entry is selected via the input device;

10 the program further commanding the processor to automatically determine actual size of an output of the scan module after the pre-scan is performed; command the scan module to perform a full scan; generate scaled copies of an output of the scan module after the full scan is performed, the copies being scaled to a size indicated by the selected entry;

15 the program further commanding the processor to rotate the copies if necessary to utilize maximum printable area on the sheet; and cause the print module to print the copies on the sheet.

11. The article of claim 10, wherein the program commands the processor to display a Photo Package entry on the display device, and wherein the controller causes the scan module to print copies of a different size on an additional sheet when the Photo Package entry is selected via the input device.

DIGITAL COPYING MACHINE INCLUDING PHOTO FEATURES FUNCTION

ABSTRACT OF THE DISCLOSURE

A digital copying machine includes a function that allows a standard photo size to be selected, an original photo to be scanned and multiple copies of the photo to be printed on a sheet. The digital copying machine automatically scales the copies to the selected size and rotates the copies to use maximum printable area.

5

FIG. 1

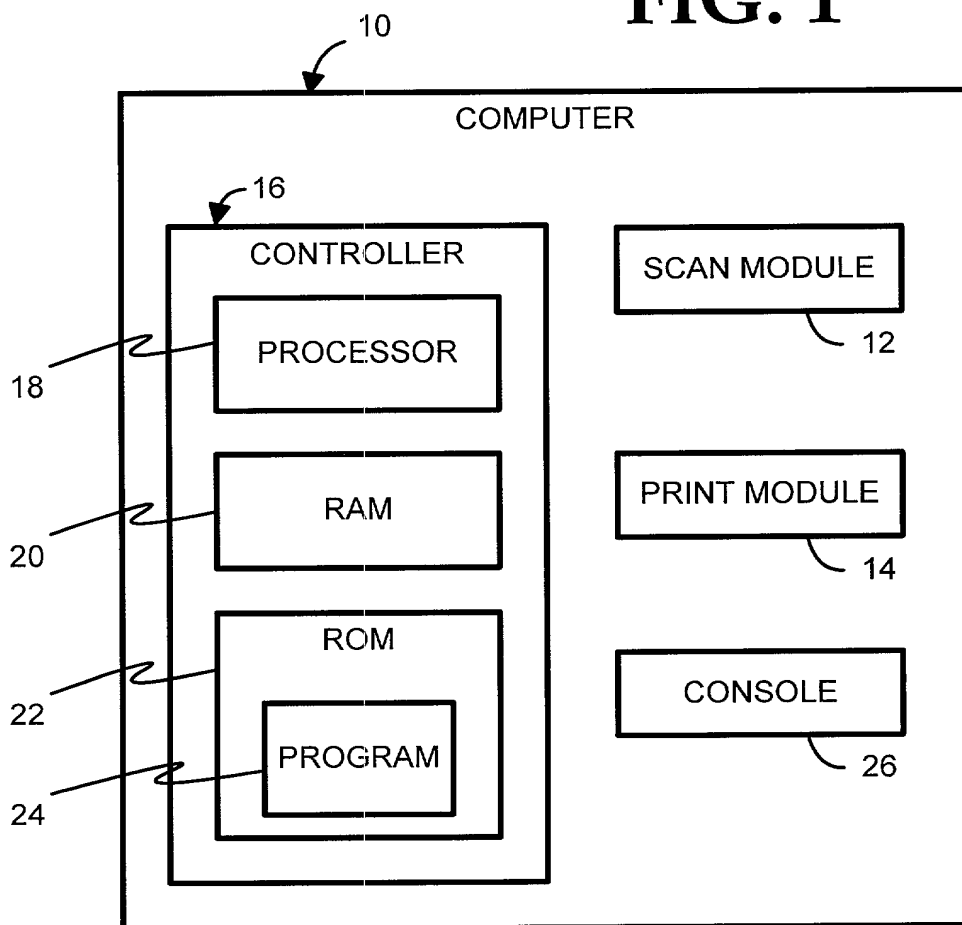


FIG. 2

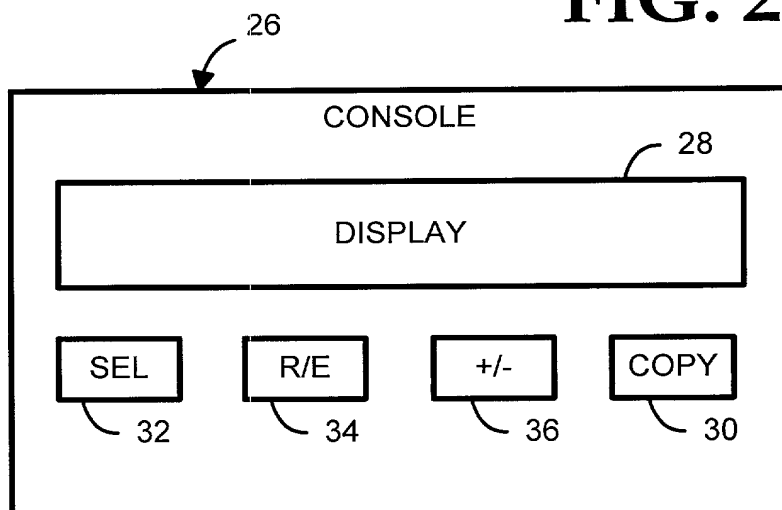


FIG. 3

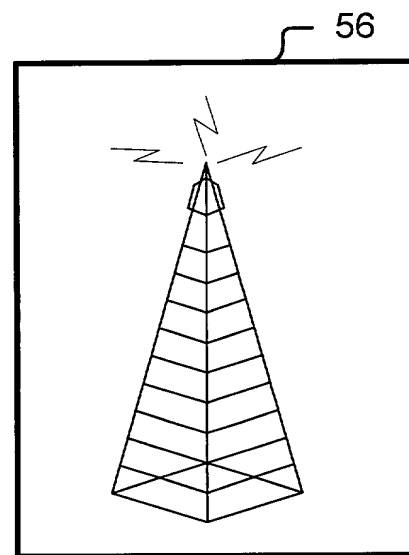
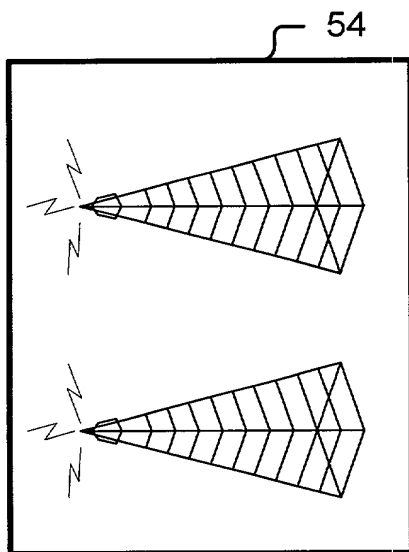
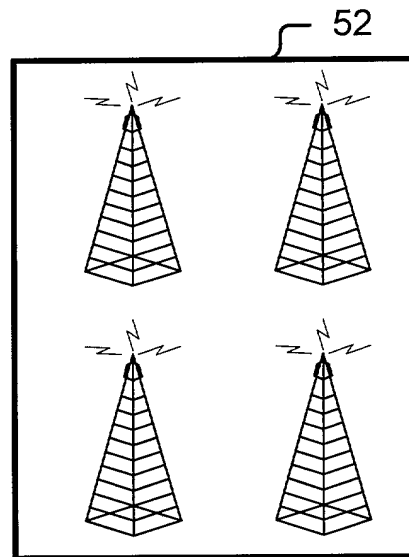
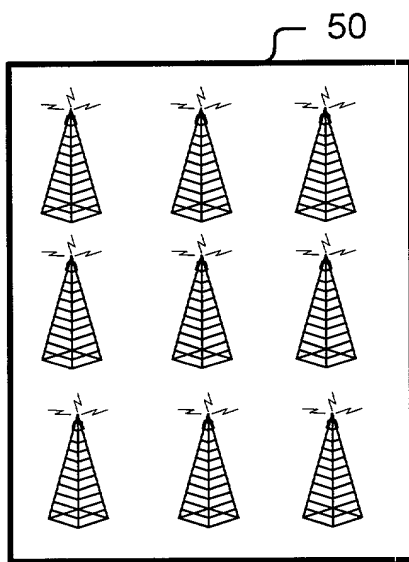


FIG. 4

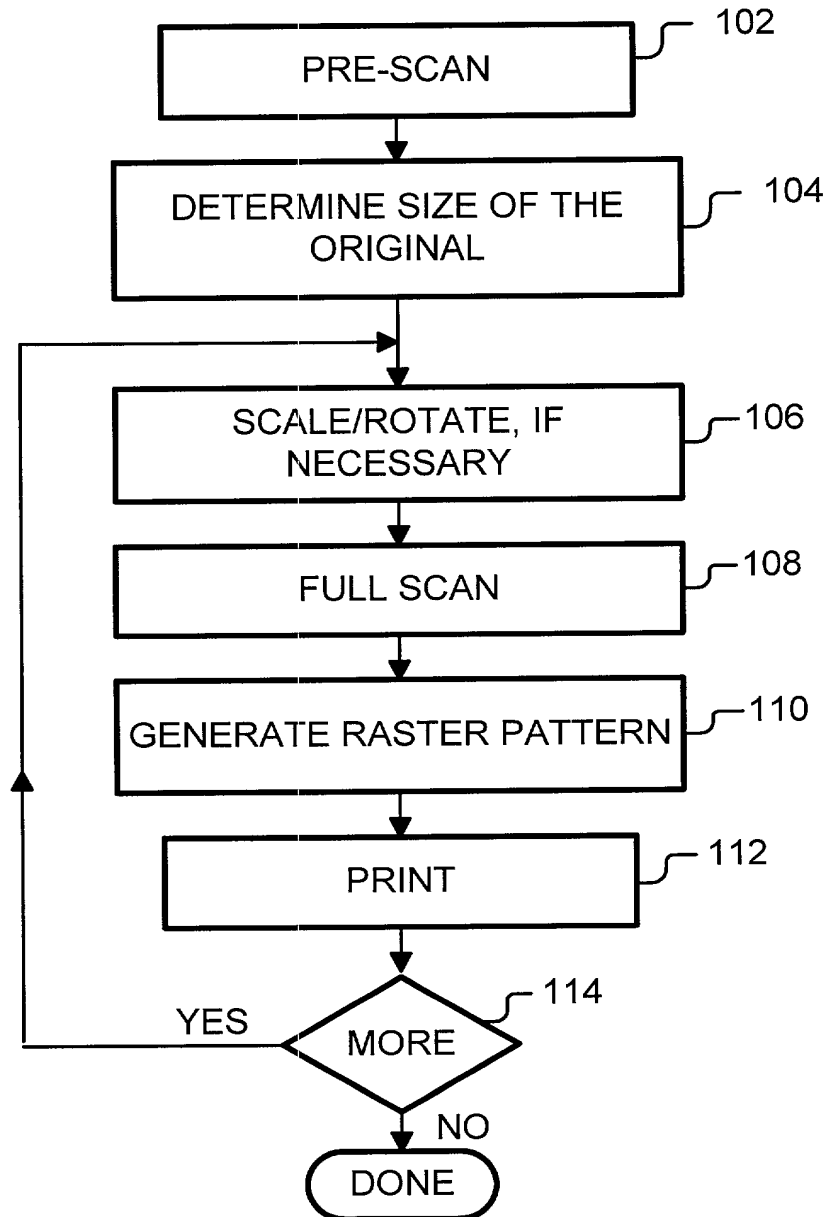
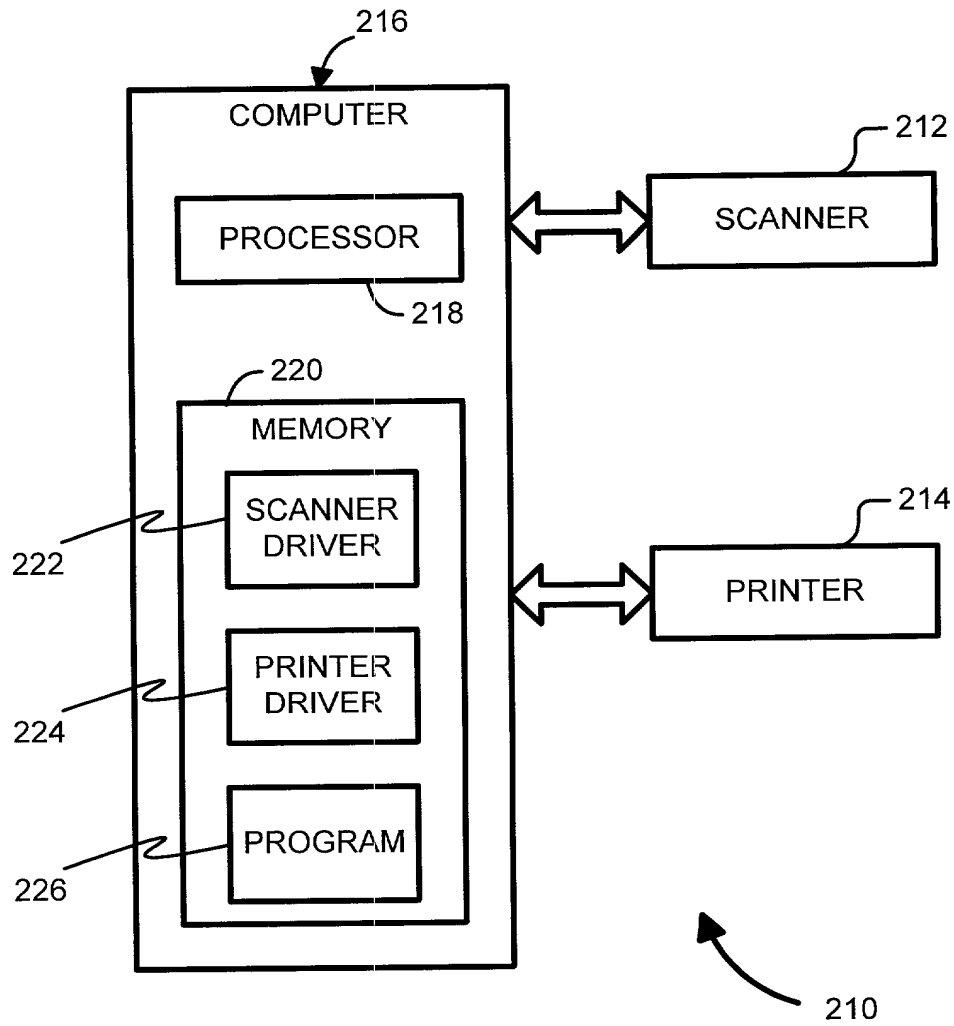


FIG. 5



DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

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As a below named inventor, I hereby declare that:

My residence/post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

DIGITAL COPYING MACHINE INCLUDING PHOTO FEATURES FUNCTION

the specification of which is attached hereto unless the following box is checked:

() was filed on _____ as US Application Serial No. or PCT International Application
Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understood the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose all information which is material to patentability as defined in 37 CFR 1.56.

Foreign Application(s) and/or Claim of Foreign Priority

I hereby claim foreign priority benefits under Title 35, United States Code Section 119 of any foreign application(s) for patent or inventor(s) certificate listed below and have also identified below any foreign application for patent or inventor(s) certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE FILED	PRIORITY CLAIMED UNDER 35 U.S.C. 119
			YES _____ NO _____
			YES _____ NO _____

Provisional Application

I hereby claim the benefit under Title 35, United States Code Section 119(e) of any United States provisional application(s) listed below:

APPLICATION SERIAL NUMBER	FILING DATE

U. S. Priority Claim

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION SERIAL NUMBER	FILING DATE	STATUS (patented/pending/abandoned)

POWER OF ATTORNEY:

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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